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# Research Note

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## A TIN CAN INFILTROMETER WITH IMPROVISED BAFFLE

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For years grazing studies have been primarily concerned with vegetation and livestock as affected by varying intensities of grazing use. It has only been a relatively short time since range technicians became aware of the detrimental effects to the soil resulting from prolonged overuse of rangelands.

Recognizing this need for specific soils data to augment vegetation and livestock information, range technicians engaged in a grazing intensity study at Miles City, Montana, in 1946[1/], tested various methods of measuring the absorptive rate of soils as affected by grazing intensity. A method that was simple, economical, and rapid was desired. Also the data obtained from such tests had to be capable of statistical analysis. In 1946, a method possessing all of the aforementioned characteristics was devised and used successfully. Other workers may also have developed similar methods but at that time, so far as is known, such a device had not been reported. In 1948, F. Lee Kirby, United States Forest Service, reported the use of a similar method (1)[2/] only for demonstration purposes.

Ordinary 46-ounce fruit juice cans from which the two ends had been removed were used. Accumulated surface plant material, both living and dead, was removed from the test areas to obtain maximum comparability between areas. The cans were then installed by placing a block of wood across the top of each one and striking the block sharply with a mallet until the can had been driven 3 to 4 inches into the ground.

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1/ A range experiment conducted by the Northern Rocky Mountain Forest and Range Experiment Station of the Forest Service in cooperation with the U. S. Bureau of Animal Industry and the Montana Agricultural Experiment Station.

2/ Number in parentheses refers to literature cited.

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After installation, a measured volume of water sufficient to equal one inch of precipitation was poured into each tin and the time required for total absorption was recorded. In these tests, it was essential that disturbance of the normal soil structure be kept to a minimum. Disturbance resulting in sealing of the surface soil would prevent a true test of absorptive rate. To minimize disturbance from the impact of water poured into the can from a 7 to 8 inch height a double thickness of ordinary window screen was placed over the top of the tin. The screen served to distribute the stream of water over a larger surface thereby reducing the impact on the soil surface at any one point.

Similar studies conducted at the Vigilante Experimental Range in southwestern Montana during the 1949 season led to a more effective means of reducing soil disturbance. The improvised "baffle" shown in the attached figure proved to be better than screen. This simple device was made by attaching a wooden handle to the circular piece of tin cut from the end of a fruit juice can. The tin was lowered into the can until it rested near the soil surface as shown. This "baffle" effectively protects the soil from the impact of poured water.

The tin can infiltrometer with baffle can be effectively used in demonstrations by both administrative and research personnel. On the ground demonstrations during field days, show-me trips, etc., will illustrate quickly and objectively the effects of grazing intensity on the absorptive rate of the soil. It must be borne in mind, however, that such demonstrations unless repeated many times are not adequate for research purposes.

LITERATURE CITED

(1) Kirb·, F. Lee Infiltration test. Journal of Forestry, Vol. 46, No. 5, May 1948, pp. 375-76.

Attachment

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This kind of gadget may be OK for getting a measure of the effect of soil pore-space (compaction) on percolation of water. This is only one of several factors that have an important bearing on overland flow and erosion, such as raindrop impact and the kind, amount, and spacing of plant and litter on the surface.